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- (71) **Applicant: EXXONMOBIL CHEMICAL PATENTS INC.** [US/US]; 5200 Bayway Drive, Baytown, TX 77520 (US).
- (72) **Inventor: BAO, Xiaoying;** 4239 Albans, Houston, TX 77005 (US).
- (74) **Agent: CHEN, Siwen et al.;** Exxonmobil Chemical Company, Law Department, P.O. Box 2149, Baytown, TX 77522-2149 (US).
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(54) **Title:** PROCESSES FOR DEHYDROGENATING ALKANE AND ALKYL AROMATIC HYDROCARBONS

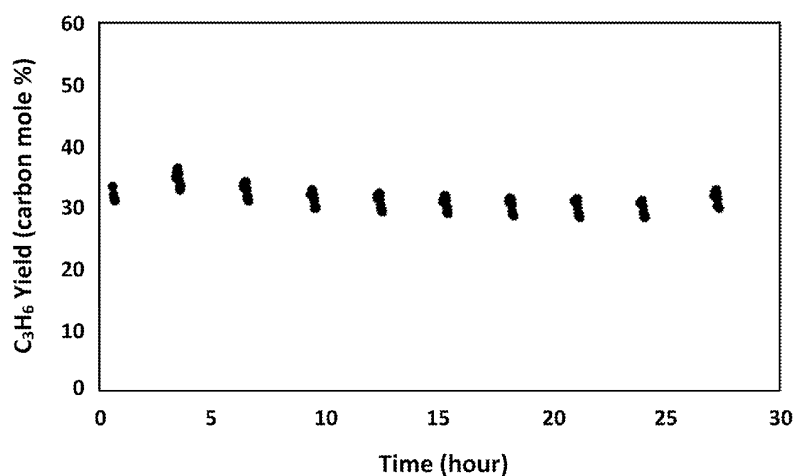


FIG. 1

(57) **Abstract:** Processes for converting an alkane to an alkene. In some embodiments, the process can include contacting a hydrocarbon-containing feed with a first catalyst that can include Pt or a second catalyst that can include Cr within a conversion zone to effect dehydrogenation of at least a portion of the hydrocarbon-containing feed to produce an effluent that can include one or more dehydrogenated hydrocarbons and molecular hydrogen. The process can also include contacting the effluent with a solid oxygen carrier disposed within the conversion zone to effect combustion of at least a portion of the molecular hydrogen to produce a conversion product that can include the one or more dehydrogenated hydrocarbons and water. In some embodiments, contacting the feed with the first or second catalyst can occur in a first conversion zone and contacting the effluent with the solid oxygen carrier can occur in a second conversion zone.

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